

Applicant : William A. Sirignano
Appl. No. : To Be Assigned
Examiner : To Be Assigned
Docket No. : 703538.4032

Remarks

This application is a continuation of patent application serial number 10/140,316, which claims priority to U.S. Provisional Patent Application Serial No. 60/296,629 filed June 6, 2001. An office action for the parent application, dated September 17, 2003, rejected Claims 1-12, 15-17, and 19-21 of the parent application. Applicant disagrees with the Examiner's basis for these rejections.

In this continuation application, Applicant cancels Claims 13-14, 18, and 22-23 and amends Claims 8, 15, 17, and 19. Applicant respectfully submits that Claims 1-12, 15-17, and 19-21, as amended, are patentable.

Independent Claim 1 recites a miniature combustor wherein the chamber has "a lateral dimension traverse to a major flow direction within the chamber that is sub-centimeter." The prior art fails to teach, suggest, or disclose all of the elements of the claimed invention. Specifically, the prior art fails to teach an operable miniature combustor wherein at least one dimension is sub-centimeter.

In general, size or dimensional limitations are not, by themselves, sufficient to patentably distinguish an invention over the prior art. However, if the size limitations would render the prior art systems or methods to fail, claimed size limitations may patentably distinguish an invention over the prior art because the size limitations make a significant difference in the operation of the prior art systems. *Gardner v. TEC Sys.*, 725 F.2d 1338, 1347, 220 USPQ 777 (Fed. Cir. 1984), *cert. denied*, 469 U.S. 830, 225 USPQ 232 (1984). In the present case, the prior art systems such as those disclosed in Schirmer (U.S. Patent No. 2,918,118), Meurer (U.S. Patent No. 3,078,672), and Schirmer (U.S. Patent No. 3,955,361) would not function at the sub-centimeter dimensions of the present invention. The dimensional aspects of miniature combustion chambers create different phenomena which prevent the principles of larger combustion chamber systems from operating in smaller, miniaturized combustion chambers.

In addition, there is a long felt, but unsatisfied need to produce highly efficient miniature combustion chambers. Highly efficient miniature combustion systems could be used in the growing number of devices that are of reduced size. These devices require a energy source with a power density which is greater than current rechargeable batteries. The present invention

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discloses such a system and tends to reduce the possibility of quenching of the flame. Other miniature combustion chambers have not solved the problems created by the high surface-to-volume ratios which result in high heat transfer losses and flame quenching. As disclosed, the present invention solves the quenching problem to create a highly efficient miniature combustion chamber. In addition, the present invention allows the use of typical hydrocarbon fuels. Other miniature combustion chambers require substitution of hydrocarbon fuels for quench resistant fuels such as hydrogen gas. Claims 2-12 depend from Independent Claim 1, and Applicant respectfully submits that Claims 1-12 are in condition for allowance.

Independent Claim 15 recites a combustion process wherein the combustion chamber comprises "a lateral dimension transverse to a major flow direction within the chamber that is sub-centimeter." In the parent application, the Examiner rejected Claims 15-16 and 19-21 as being anticipated by Schirmer (U.S. Patent No. 2,918,118) and by Meurer (U.S. Patent No. 3,078,672). Applicant respectfully submits that Claims 15-16 and 19-21 are not anticipated by these references because the references fail to disclose each and every element of Independent Claim 15, as amended. Claim 15 is not anticipated by either Schirmer or Meurer because neither reference discloses use of the method wherein the combustion chamber comprises at least one dimension which is sub-centimeter. As discussed above, the size limitations of the present invention patentably distinguish the present invention because prior art methods would fail at such dimensions. Therefore, Claim 15, and the claims that depend directly upon Claim 15, are not anticipated by the cited references.

Accordingly, because the prior art fails to teach, suggest, or disclose all of the elements of the claimed invention, Applicant respectfully submits that Claims 1-12, 15-17, and 19-21 are in condition for allowance.

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Conclusion

Applicant submits that the claims are in condition for allowance. Should the Examiner have any questions regarding this Amendment, he is invited to call the undersigned attorney at (949) 567-6700.

Respectfully submitted,

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